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II. Solution by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

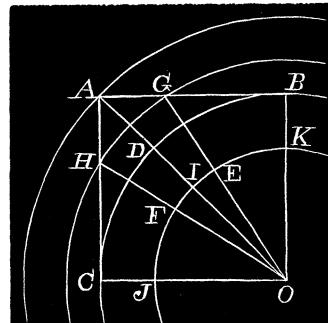
Let $OB = OC = OD = s$, $OI = x$, $OG = OH = w$; then $OA = s\sqrt{2}$, area of $\square ABOC = s^2$, and area of circle radius of which is $OA = 2\pi s^2$.

First Solution.—Knowing the favorable chances and the whole number of chances, the required chance becomes

$$C = \frac{s^2}{2\pi s^2} = \frac{1}{2\pi} \dots \dots \dots (A).$$

SECOND SOLUTION.

The arc JIK increases for all values of OI less than OD ; and the arc HG decreases for all values of OG greater than OD . The required chance, therefore, becomes



$$\begin{aligned} C &= \frac{1}{2\pi s^2} \left\{ \frac{\pi}{2} \int_0^s x dx + \int_s^{s\sqrt{2}} \left[\frac{\pi}{2} - 2 \cos^{-1}\left(\frac{s}{w}\right) \right] w dw \right\} \\ &= \frac{1}{8} + \frac{1}{2\pi^2} \left[\frac{\pi s^2}{4} - 2 \int_s^{s\sqrt{2}} \cos^{-1}\left(\frac{s}{w}\right) w dw \right] \\ &= \frac{1}{4} - \frac{1}{2\pi^2} \left[w^2 \cos^{-1}\left(\frac{s}{w}\right) - s\sqrt{(w^2 - s^2)} \right]_s^{s\sqrt{2}} \\ &= \frac{1}{4} - \frac{1}{2\pi} \left[\frac{\pi}{2} - 1 \right] = \frac{1}{2\pi} \dots \dots \dots (B). \end{aligned}$$

This problem was solved with different results by H. W. DRAUGHON, P. H. PHILBRICK, and WILLIAM B. MILWARD. If we have space, some of these solutions will be published next month.

PROBLEMS.

6. Proposed by Professor J. F. W. SCHEFFER, Hagerstown, Maryland.

Find the average length of all the diameters that can be drawn in a given ellipse.

7. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy in New Windsor College, New Windsor, Maryland.

A letter received is known to have come either from *Oshkosh* or *Ashland*. The only two consecutive letters legible on the postmark are *SH*. What is the probability that the letter received came from *Oshkosh*?

8. Proposed by Professor G. B. M. ZERR, A. M., Principal of High School, Staunton, Virginia.

Prove that the mean area of all triangles having their vertices upon the surface of a given triangle and bases parallel to the base of the given triangle, is $\frac{1}{270}$ (area of given triangle).